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February 14, 2007 FILED/ACCEPTED

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Federal Communications Commission  
Office of the Secretary

**VIA HAND DELIVERY**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
Office of the Secretary  
445 12th Street, S.W.  
Washington, D.C. 20554

**Re: Written Ex Parte Submission of Polnet Communications, Ltd.  
MM Docket No. 99-325**

Dear Ms. Dortch:

We write on behalf of Polnet Communications, Ltd., licensee of Station WRKL(AM), New City, New York ("WRKL"). WRKL operates on 910 kHz with transmission facilities located in nearby Pomona, New York. The station's authorized transmitter power output is 1 kW daytime, 800 watts nighttime. WRKL places a 0.5 mV/m contour signal over much of New York City, both daytime and nighttime.

The station's schedule is dominated by foreign-language programming, as well as local public service shows. Its Polish-language programming, which runs 24 hours per day, seven days a week, offers a unique service to some 1.05 million Polish-Americans, for whom WRKL provides a window on American political, social, and cultural issues, as well as Eastern European matters, including governmental, economic, and religious issues. WRKL provides a lifeline to this community and prides itself on "giving back" to the community local programming responsive to community needs.

WRKL's limited power and small revenue base, combined with the sideband splatter and other interference problems experienced by all AM stations in congested major markets, render its ability to compete with much larger, more powerful stations in the nation's largest metropolitan area problematic. It is essentially a small-market fish operating in a large market pond. Accordingly, it is critical to WRKL's survival that its signal, limited as it is, be free of interference and as strong as possible.

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Unfortunately, with the advent of in band on channel ("IBOC") digital signals for AM stations, WRKL, like many of its brethren, has experienced serious and persistent interference to its signal. As other parties have commented in this docket, the digital signals of other the higher-powered AM stations, carried on sidebands adjacent to the frequencies occupied by the victims of the interference, have spilled over the spectrum "mask" allocated to them. These spurious emissions have severely impacted stations like WRKL and have motivated some commenters in the instant proceeding to opine that the IBOC HD system should not be allowed on the AM Band.

In WRKL's case, the interference is caused by the sidebands of third-adjacent channel station WCBS(AM), New York City, New York. WCBS operates on 880 kHz. Its authorized power is 50 kW, unlimited hours, non-directional. The two stations' protected field-strength contours overlap. For months, ever since WCBS inaugurated IBOC HD programming in July 2006, WRKL has experienced severe interference to its listening audience in New York City and elsewhere in the New York metropolitan area. It has lost listeners and advertisers, who have complained of the problem in areas within WRKL's protected contour and close to WCBS' transmitting facilities.

WRKL has engaged in discussions with WCBS, who has apparently taken steps to filter or attenuate its digital signal on its sidebands. Recently, WCBS has also taken its HD programming off the air. The result has been the disappearance of complaints when the digital signal is off, but the fundamental problem remains that, when the signal is on, in certain areas, WRKL's signal is undermined by "digital hash" created by WCBS' digital signal. Negotiations with WCBS to resolve the problem are ongoing.

In order to document this situation, WRKL retained Lewis Collins of Broadcast Signal Lab in Cambridge, Massachusetts. Attached hereto are Mr. Collins' study and measurements conducted on October 23, 2006. He performed field measurements at four locations in the New York City metropolitan area to assess the interference received by WRKL. He also made spectrum measurements of the WCBS signal to ascertain its compliance with the NRSC-5 mask, the standard utilized by the radio industry to deal with the potential for IBOC HD interference. Finally, he made measurements of the signal of WFAN, which transmits on 660 kHz from the same tower as WCBS, for comparison purposes.

Mr. Collins concludes that at three locations in the New York City Metro, "digital hash" was audible underneath the WRKL audio in the loudspeaker of his field strength meter. (At 4.) He observes that the upper spectral regrowth sideband of WCBS, which is co-channel with WRKL's carrier frequency, is approximately 3dB out of specification

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under the applicable NRSC-5 standard. He believes that the interference to WRKL could be reduced by WCBS based on WFAN's signal measurements, if filters are installed or other action taken to reduce the amplitude of the spectral regrowth sideband.

However, importantly, Mr. Collins also notes that IBOC digital signals are intentionally transmitted on the first adjacent channel to the analog signal. He states that an "unresolved question" remains whether, no matter what WCBS does, WRKL's interference persists because of "inadequate second-adjacent channel selectivity in typical broadcast receivers that are being used for the reception of WRKL." (At 13.) If this is the case, WCBS' digital sidebands, which are either co-channel or second adjacent to WRKL, present an insurmountable problem in that the typical radio receiver cannot distinguish between WRKL's carrier frequency and WCBS' sidebands. As Mr. Collins observes, these sidebands are "present 100% of the time, and hence are much more noticeable to the WRKL listener." (At 14.)

Stated another way, WCBS' primary digital sideband operates in much the same way as a Class B AM analog station with 6kW of carrier power on 890 kHz. WRKL has only 1kW of TPO. The FCC would not accept that degree of potential signal interference were IBOC HD not involved, and it should not accept it, in spite of the great expectations for digital radio, with IBOC HD in the mix.

WRKL notes that the FCC is not without authority to address this situation. The NRSC-5-A IBOC Broadcasting Standard, published in September 2005, itself provides that:

"[t]he requirements for noise and spurious emissions limits illustrated [above] reflect acceptable performance criteria. In certain circumstances, additional measures (filtering, active emissions suppression, etc.) may be needed to reduce the spectral emissions below the limits given in this subsection to reduce mutual interference between broadcast stations." (At n.4, p.25.)

The NRSC standard has not been made part of the FCC's rules in order to permit greater flexibility in dealing with the difficult interference issues presented by IBOC HD Radio. The FCC should take advantage of that flexibility to address the seemingly intractable digital hash issue arising from IBOC HD Radio operating in a third-adjacent channel environment.

Similarly, Section 73.44(c) of the AM rules allows the FCC to go beyond the emission limitations specified in §73.44 (a) and (b):

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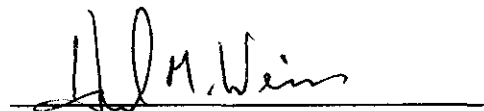
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“Should harmful interference be caused to the reception of other broadcast or non-broadcast stations by out of band emissions, the licensee may be directed to achieve a greater degree of attenuation than specified in paragraphs (a) and (b) of this section.”

What steps should the Commission take to deal with this thorny issue? First, as other commentators have argued, it may be necessary to prohibit any further AM IBOC broadcasts until solutions to the digital hash problem can be found, either through filters or directional antennas or other means. Alternatively, the Commission should require substantial reductions in power to reduce emissions or permit only certain AM stations with no second or third adjacent stations nearby and with no overlapping contours to utilize IBOC HD. Extensive studies of the interference issues here should be commissioned before the problem grows to crisis proportions.

The public interest requires that the Commission proceed cautiously here. The promise of digital IBOC is great, but there is no justification for subjecting AM radio, which has suffered so greatly from interference and splatter, to suffer further from digital hash. This is particularly true where, as is so often the case, group-owned high power stations cause interference to stand alone, local lower power stations struggling to compete in a fast consolidating business sector. WRKL asks the Commission to stop, look, and listen before the digital interference issue begins wiping out AM facilities across the nation.

Sincerely,

A handwritten signature in dark ink, appearing to read "H.M. Weiss", is written over a horizontal line.

Frank R. Jazzo, Esquire  
Howard M. Weiss, Esquire  
Counsel for Polnet Communications, Ltd.

HMW/jpg

Enclosure

FLETCHER, HEALD & HILDRETH, P.L.C.

Marlene H. Dortch, Secretary

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cc (w/encl.): Chairman Kevin J. Martin (via Electronic Delivery)  
Commissioner Michael J. Copps (via Electronic Delivery)  
Commissioner Jonathan S. Adelstein (via Electronic Delivery)  
Commissioner Deborah Taylor Tate (via Electronic Delivery)  
Commissioner Robert M. McDowell (via Electronic Delivery)  
Heather Dixon, Esquire (via Electronic Delivery)  
Bruce Gottlieb, Esquire (via Electronic Delivery)  
Rudy Brioché, Esquire (via Electronic Delivery)  
Chris Robbins, Esquire (via Electronic Delivery)  
Christina Chou Pauzé, Esquire (via Electronic Delivery)  
Monica S. Desai, Esquire (via Electronic Delivery)  
Roy Stewart, Esquire (via Electronic Delivery)  
Peter H. Doyle, Esquire (via Electronic Delivery)  
Mr. James Bradshaw (via Electronic Delivery)  
Ms. Susan Crawford (via Electronic Delivery)



## **Interference Study**

**Performed for**

**Radio Station WRKL  
910 kHz  
1551 Route 202  
Pomona, New York 10970  
City of License: New City, New York**

**Measurements Performed on  
October 23, 2006**

**Broadcast Signal Lab, LLP  
64 Richdale Avenue  
Cambridge, MA 02140-2629**

**Telephone: 617-864-4298  
FAX: 617-661-1345**

## ***Introduction***

AM Radio Station WRKL operates on an assigned frequency of 910 kHz with transmission facilities located at 1551 Route 202, Pomona, New York. The station's authorized transmitter power output is 1 kW daytime, 800 watts nighttime. The WRKL antenna system consists of four guyed towers installed in a marsh behind the transmitter building. The daytime and nighttime patterns are different.

Broadcast Signal Lab engineer Lewis D. Collins performed field measurements at four locations in the Metropolitan New York City area on October 23, 2006 to assess the interference received by WRKL within its 0.5 mV/meter daytime service contour.

BSL also made spectrum measurements of the WCBS signal to ascertain its compliance with the NRSC-5 mask. AM radio station WCBS operates on an assigned carrier frequency of 880 kHz, which is the third-adjacent channel to WRKL. The WCBS authorized power is 50kW, unlimited hours, non-directional. The protected contours of WRKL and WCBS overlap.

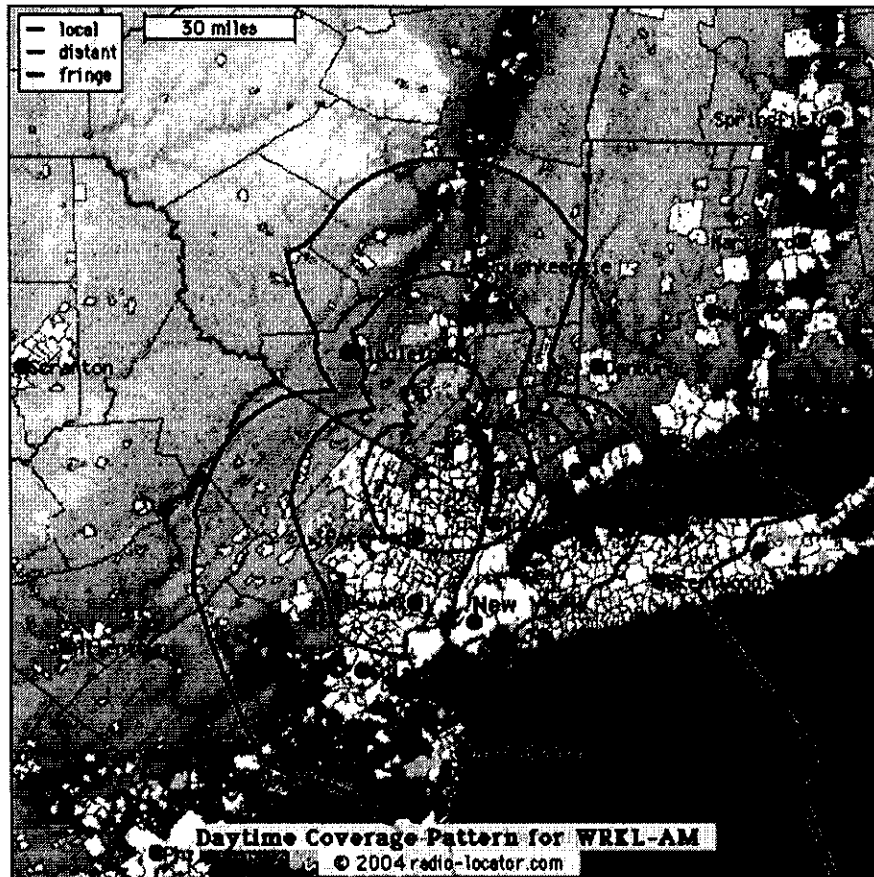
For comparison purposes, BSL also made spectrum measurements of the WFAN signal to ascertain its compliance with the NRSC-5 mask. WFAN transmits 50kW from the same 520-foot top-loaded tower as WCBS, located on High Island in Pelham Bay, Long Island Sound.

## ***Theoretical Field Strength Plots***

Figures 1a and 1b below show theoretical coverage patterns for the daytime and nighttime signal of WRKL as computed by RadioLocator's web site. One of BSL's objectives was to spot check the WRKL signal at several locations within the 0.5 mV/m contour. Figure 1 was used to guide the selection of suitable measurement locations.

The theoretical nighttime plot is included for information only, as no measurements were taken for the nighttime pattern of WRKL.

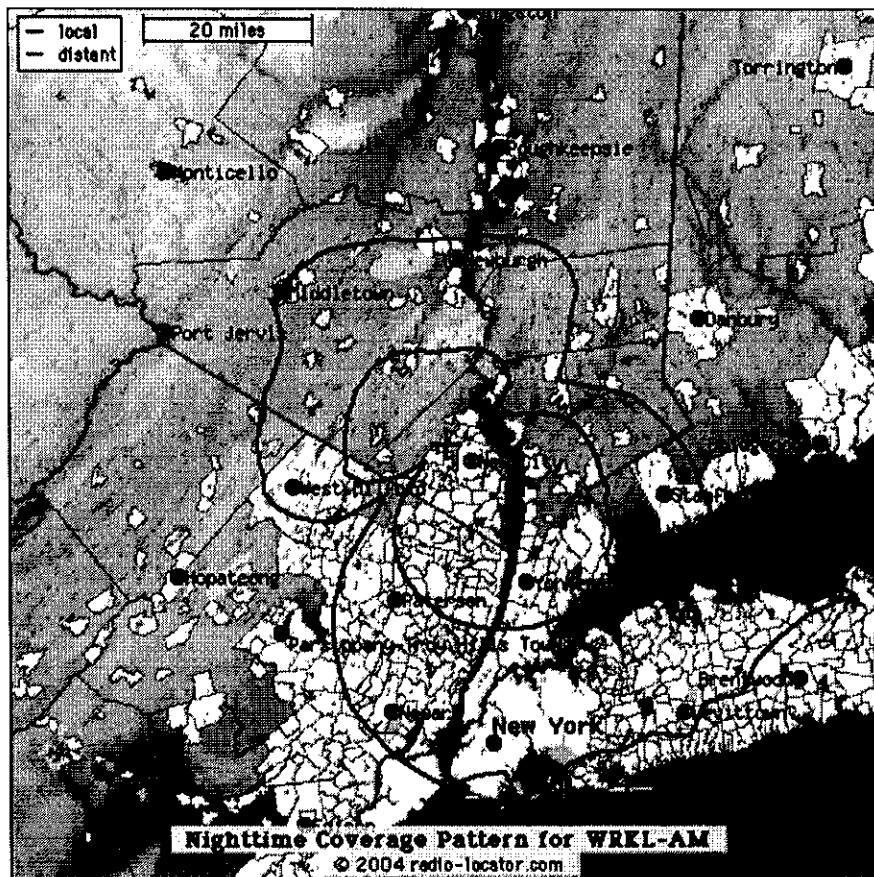
Both the daytime and nighttime 0.5 mV/m contours of WRKL include much of New York City.



Legend: Local = 2.5 mV/m, Distant = 0.5 mV/m, Fringe = 0.1 mV/m

Figure 1a – Theoretical Daytime Coverage for WRKL 910 kHz





Legend: Local = 2.5 mV/m, Distant = 0.5 mV/m

Figure 1b – Theoretical Nighttime Coverage for WRKL 910 kHz

### Signal Strength Measurements

Table 1 below summarizes the signal strength measurements made by BSL. At all three measurement locations, digital “hash” was audible underneath the WRKL audio in the loudspeaker of the FIM-41 field strength meter. No attempt was made to ascertain the signal-to-noise ratio of the demodulated WRKL audio.

<i>Location</i>	<i>Time of Meas. (EDT)</i>	<i>Latitude dd-mm-ss</i>	<i>Longitude dd-mm-ss</i>	<i>Dist From WRKL (km)</i>	<i>WRKL field strength (mV/M)</i>	<i>WCBS field strength (mV/M)</i>
Binney Park Greenwich, CT	10:42AM	41-02-03	73-34-17	43.2	0.35 to 0.42 <sup>1</sup>	62
Rockefeller Lookout Palisades Pkwy	2:46PM	40-53-33	73-56-30	33.3	1.2	44
Alpine Lookout Palisades Pkwy	2:54PM	40-55-51	73-55-38	29.5	1.2	96

Table 1 – Signal Strength Measurement Results

### **WCBS HD Radio™ Spectrum Measurements**

The spectrum of the WCBS HD Radio™<sup>2</sup> signal was measured from the Orchard Beach parking lot in the Bronx, New York City. This location provided BSL with a large open area to set up the test equipment, well away from utility lines and man-made structures.

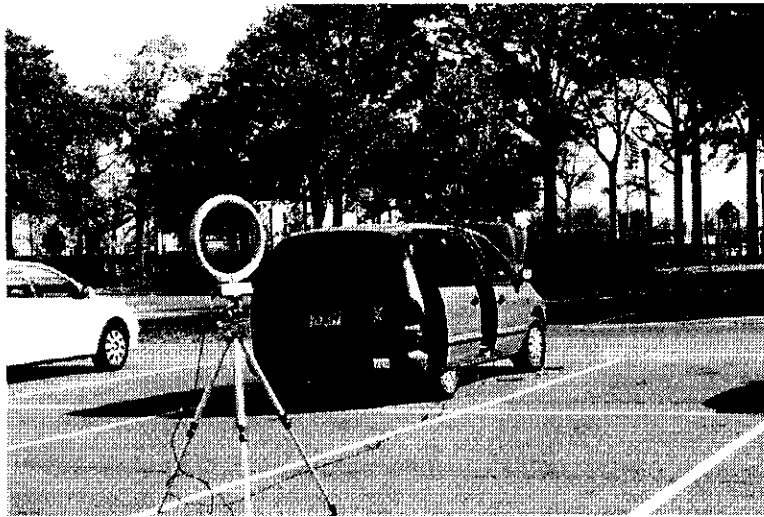


Figure 2 – Field Location for WCBS/WFAN Spectrum Measurements

<sup>1</sup> The fluctuation in signal level observed at this site may have arisen from co-channel interference from another station operating on 910 kHz. This would arise from the distant station's carrier beating with the WRKL carrier.

<sup>2</sup> HD Radio™ is a registered trademark of Ibisquity Digital Corp.

The measurement location was at Latitude 40 deg 52 min 5.6 sec, Longitude 73 deg, 47 min, 42.2 sec, which is 1.22 km from the WCBS transmitter tower. The heading to WCBS from the test site was 141 deg true.

The procedure used by Broadcast Signal Lab for measuring the WCBS HD Radio™ sidebands is that specified in NRSC-5<sup>3</sup>. Table 2 summarizes the AM Hybrid HD Radio™ Spectral Emission Limits specified in NRSC-5.

Lower Freq Offset (kHz)	Upper Freq Offset (kHz)	Measured Power Spectral Density Shall not Exceed (dBc in 300 Hz Resolution Bandwidth, 30 second average)
5.0	10.0	-34.3 dBc
10.0	15.0	-26.8 dBc
15.0	15.2	-28 dBc
15.2	15.8	$-39 - (\text{offset frequency in kHz} - 15.2) \times 43.3 \text{ dBc}$
15.8	25.0	-65 dBc
25.0	30.5	$-65 - (\text{offset frequency in kHz} - 25) \times 1.273 \text{ dBc}$
30.5	75.0	$-72 - (\text{offset frequency in kHz} - 30.5) \times 0.292 \text{ dBc}$
75.0	And up	-85 dBc

**Table 2 – AM Hybrid HD Radio™ Spectral Emission Limits**

The instruments used for these measurements were an Advantest model R3465 spectrum analyzer S/N 82420196 and Chris Scott & Associates model LP-3 loop antenna S/N 080406. The spectrum analyzer was last calibrated by Advantest on 19 December 2003.

In Figures 3 through 5 the data capture time was approximately 60 seconds<sup>4</sup> at 120 msec per division continuous sweep with the spectrum analyzer in “averaging” mode. The vertical scale is 10 dB per division and the horizontal scale is 5 kHz per division (50 kHz total span). The analyzer resolution bandwidth was 300 Hz and the video filter was turned off (by setting the video bandwidth to 300 Hz). The unmodulated carrier level was set at the top horizontal line of the display. The plots were made between 11:54 AM and 11:58 AM EDT and were stored in the PC Card memory of the analyzer.

<sup>3</sup> National Radio Systems Committee, *In-Band/On-Channel Digital Radio Broadcasting Standard NRSC-5* (April 2005), available at <http://www.nrsstandards.org>

<sup>4</sup> NRSC-5 recommends a minimum 30 seconds averaging time. 60 second averaging time used here was selected to provide additional smoothing of the data.

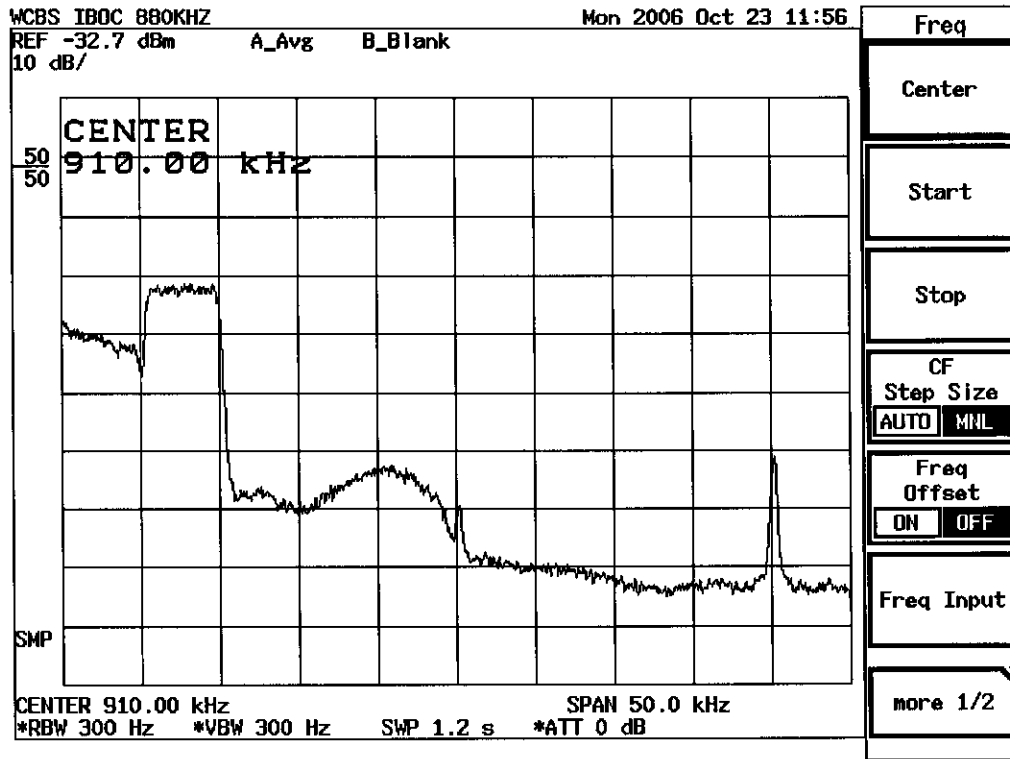


Figure 3 – WCBS HD Radio™ Upper Sidebands

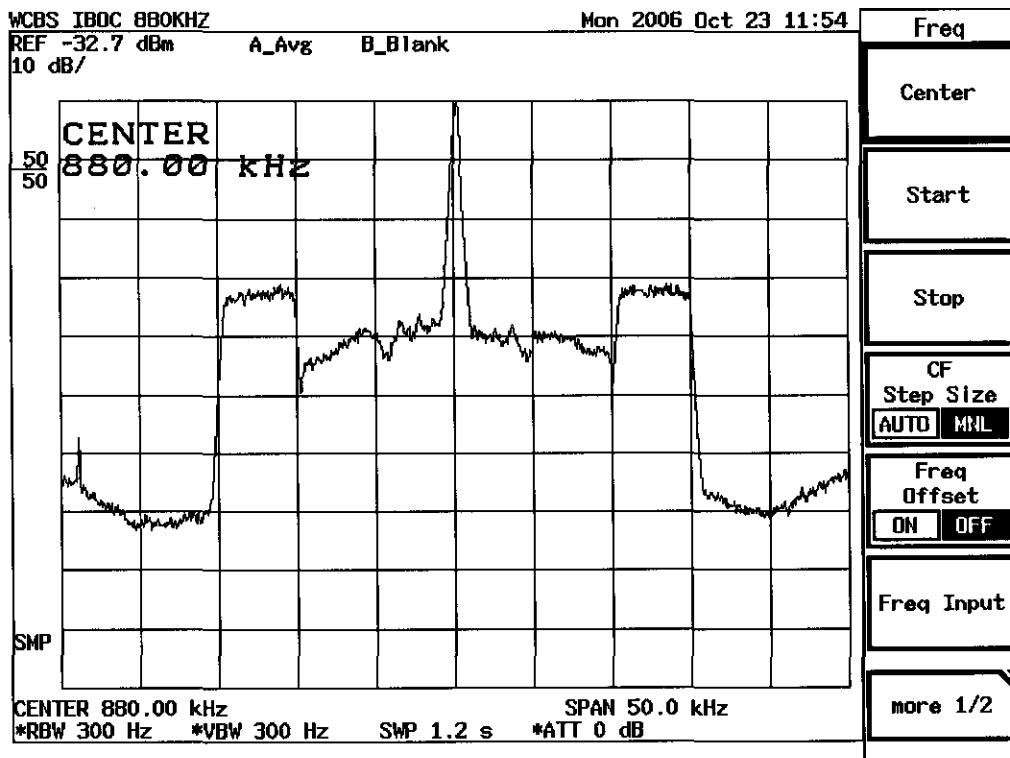


Figure 4 – WCBS HD Radio™ Sidebands (centered on 880 kHz)

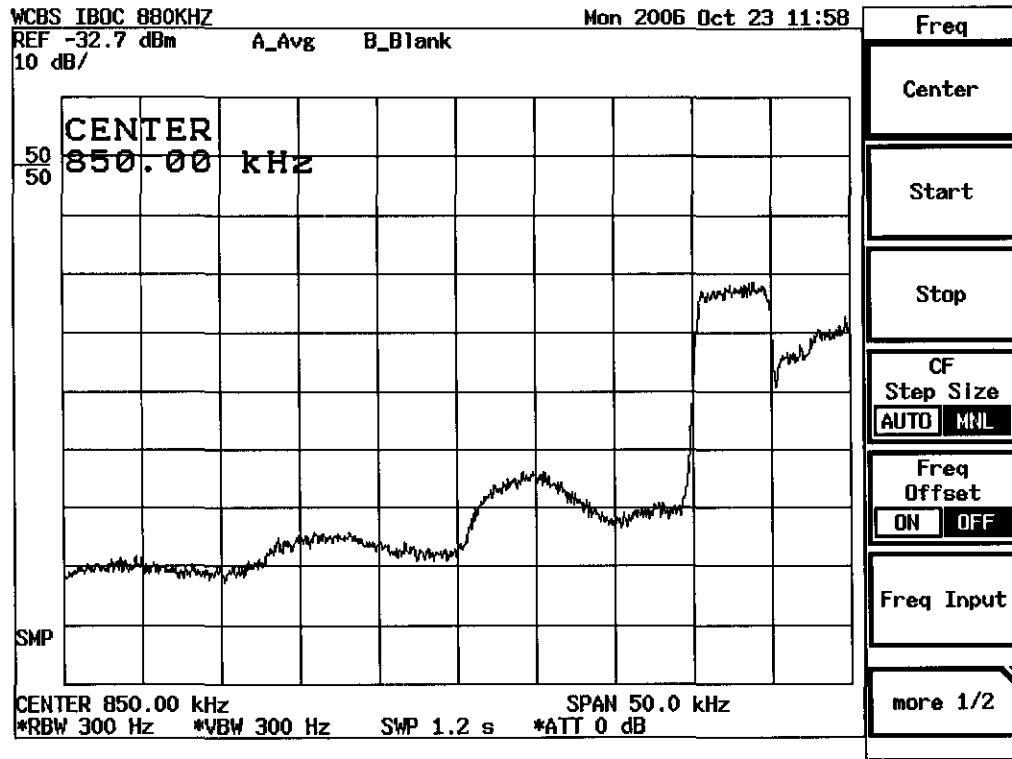


Figure 5 – WCBS HD Radio Lower Sidebands

### Primary Digital Sidebands

Figures 3, 4, and 5 show that the measured power spectral density of the primary digital sidebands (10 to 15 kHz offset from the carrier) is  $-32$  dBc or less, at least 5 dB below the NRSC-5 specification of  $-26.8$  dBc.

Furthermore, observe that there is some amplitude asymmetry in the primary digital sidebands, indicating that the WCBS transmission facility exhibits some roll-off in its lower sideband response. This likely arises from the diplexer filters, which permit WCBS and WFAN to share one antenna tower.

The carrier of WRKL can be seen in Figure 3 at 910 kHz. However it is in the null of the Scott loop antenna at this location so that nothing can be inferred about its level relative to WCBS from this plot.

### Spectral Regrowth Sidebands

Figures 3 and 5 show that the measured power spectral density of the “spectral regrowth” digital sidebands (20 to 30 kHz offset from the carrier, centered on 25 kHz offset) is  $-62$  dBc or less, which exceeds the NRSC-5 limit of  $-65$  dBc. These sidebands are co-channel with the WRKL signal, which occupies 900 to 920 kHz.

Also of technical interest is the appearance of additional spectral regrowth centered at 37.5 kHz below the WCBS signal at a level of  $-75$  dBc, just meeting the NRSC specification. For the upper sideband the signal at +37.5 kHz offset is at a level of approximately  $-80$  dBc. On the lower sideband, this signal is at a level of approximately  $-76$  dBc.

Additional spectral regrowth can be seen at a level of about  $-80$  dBc centered on 50 kHz below the WCBS carrier. This meets the NRSC-5 specification.

The analyzer noise floor was about  $-90$  dBc (in a 300 Hz bandwidth) at the settings used for plotting Figures 3 through 5.

### ***WFAN Spectrum Plots***

The spectrum of the signal from radio station WFAN (660 kHz) was measured in the same manner as that of WCBS discussed above. The results are shown in Figures 6, 7, and 8 below.

Notice that the spectral regrowth sidebands of the WFAN signal are at  $-72$  dBc, or less. This is appreciably below the level of those sidebands in the WCBS signal. The WFAN primary digital sidebands are at approximately the same level as those of WCBS.

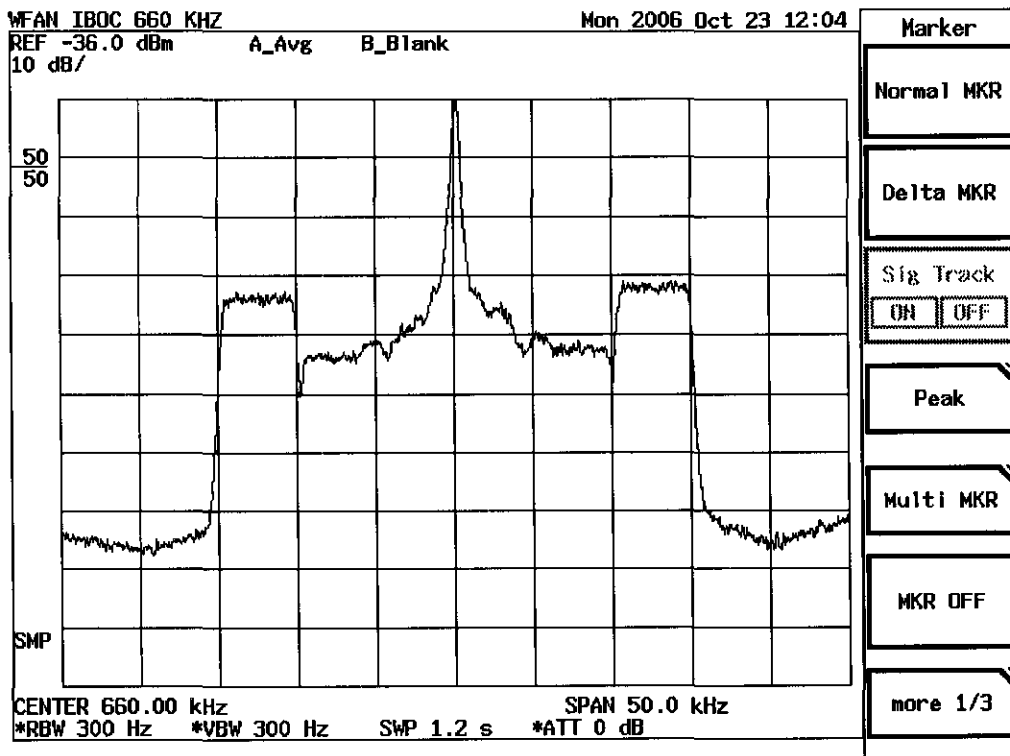


Figure 6 - WFAN HD Radio Primary Digital Sidebands



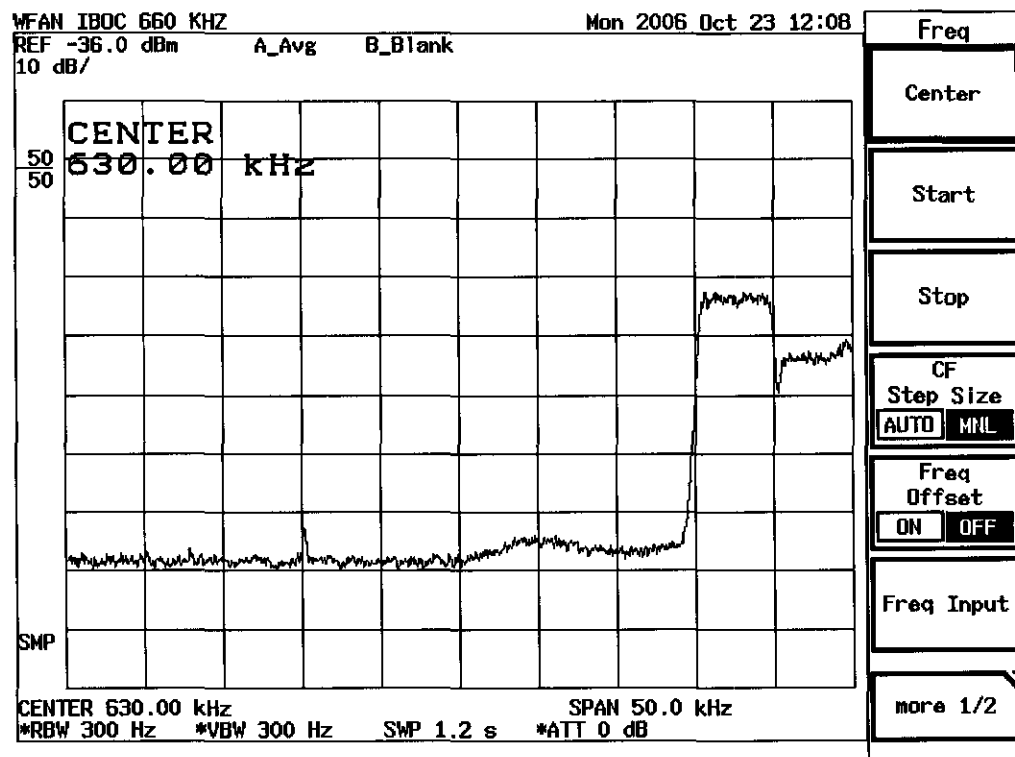


Figure 7 - WFAN HD Radio Lower Sidebands

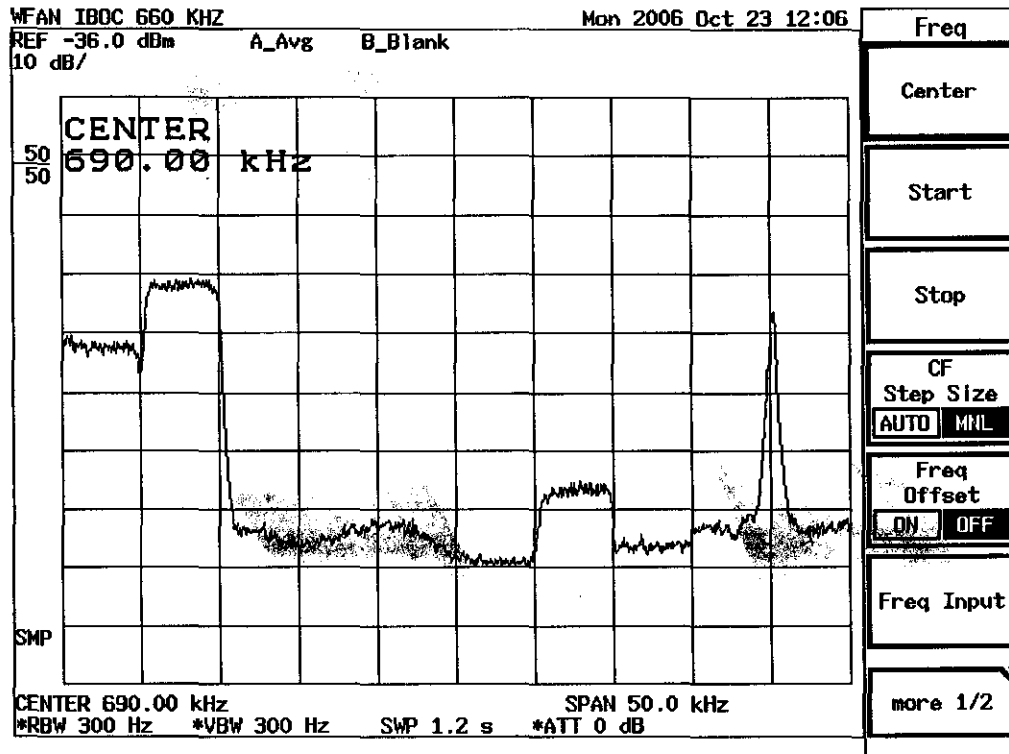


Figure 8 - WFAN HD Radio Upper Sidebands

The signal at 710 kHz in Figure 8 is the HD Radio signal of radio station WOR.

### Conclusion

Digital "hash" can be heard on the WRKL signal within its 0.5 mV/m protected contour. This digital hash may be produced by the upper spectral regrowth sideband of WCBS, which is approximately 3 dB out of specification. The upper spectral regrowth sideband of WCBS is co-channel with WRKL.

Measurements of co-located station WFAN suggest that it should be technically feasible to attenuate the WCBS spectral regrowth sidebands by an additional 10 dB, which may provide a significant reduction in the interference that WRKL is receiving within its protected 0.5 mV/m contour.

However, an unresolved question at this time is whether the mechanism responsible for the WRKL interference arises from inadequate second-adjacent channel selectivity in typical broadcast receivers that are being used for the reception of WRKL. The upper primary digital sideband (890 to 895 kHz) of the WCBS signal falls within the lower second-adjacent channel of WRKL. In contrast with second-adjacent channel "audio

splatter" which tends to occur with a low duty cycle, the WCBS digital sidebands are present 100% of the time, and hence are much more noticeable to the WRKL listener.

### ***Certification***

Lewis D. Collins certifies that he is a Senior Radio and Telecommunications Engineer with Broadcast Signal Lab., LLP. He has been doing business as a radio frequency engineering consultant as RLC Consultants since 1994 with offices located at 10 Marshall Terrace, Wayland, MA 01778-1104. He previously held communications engineering positions with Tiernan Communications, Inc., Wang Laboratories, Inc., and the Massachusetts Institute of Technology. He holds the degree of Bachelor of Science in Electrical Engineering from Purdue University, and the degrees of Master of Science and Doctor of Science in Electrical Engineering from the Massachusetts Institute of Technology. He holds a lifetime General Radiotelephone Operator's License (PG-1-8954), and formerly held a Radiotelephone Operator's License, First Class (P1-1-21144). He is a Life Member of the Institute of Electrical and Electronics Engineers (IEEE), a member of the Society of Broadcast Engineers (SBE), and a Senior Member of the National Association of Radio and Telecommunications Engineers (NARTE). He holds NARTE certification as a Master Radio and Telecommunications Engineer in Broadcasting, Cable Television, and Computer Communications (E1-02247). He has been certified by SBE as a Certified Broadcast Technologist (CBT).

This report was prepared by him personally and is true and accurate to the best of his belief and knowledge.

---

Lewis D. Collins  
November 6, 2006